OWNER'S MANUAL

ACOUSTIC ENERGY

LINEAR three

Contents

Page	Section	
	1	Introduction
1	2	Handling
1	3	Installation
2	4	Positioning
3	5	Connecting
4	6	Amplifiers
4	7	Listening
4	8	Specification
5	9	The Linear Range
5	10	Warranty
5	11	Contact Acoustic Energy

1. Introduction

Welcome to the Linear Three. Perhaps more than any other hi-fi product, speakers are sensitive to installation so please take a little time to read this manual and to follow, as far as practical, the installation guidelines it contains. Careful installation will help ensure that your Linear Threes perform optimally. Should you have any questions not covered here we are happy to try and answer them either by telephone or email. Contact information can be found in Section 11.

Following this introduction, the Manual is divided into sections covering handling, installation, positioning, amplifier compatibility, connection, listening, matching products, specifications, warranty and contact information. We recommend that you read at least the first five of these sections carefully before installing and using your Linear Threes.

2. Handling

The Linear Three is a relatively delicate precision engineered product that can be damaged by inappropriate handling. It is also large and heavy. Please take great care therefore when unpacking or moving the speakers. Plan any handling in advance of carrying it out - ideally with a second person to help. Please take care when unpacking or moving the speakers not to touch either of the drivers. Damage to a driver will at best degrade a Linear Three's performance and at worst result in its complete failure.

The enclosure surfaces should also be handled sympathetically. Any cleaning should only require a soft cloth, slightly dampened if necessary. Be wary of using any polishes or solvent based cleaning agents.

The packaging should be retained for future use.

3. Installation

The Linear Three is a floor-standing loudspeaker intended to be positioned clear of room boundaries and coupled to the supporting floor through spikes. If spikes are inappropriate for your floor covering, metal protection pads, coins for example, maybe used between the spike and the floor.

The separately packed plinths must be attached to the botttom of each Linear Three before they can be installed. Invert each speaker onto a "protective" piece of material so as not to damage the top of the cabinet. Insert the four screws (supplied in the packaging) through the holes in the plinth and line them up with the pilot holes in the cabinet. Screw them into the cabinet making sure that the plinth is firmly attacthed. Failure firmly to attach the plinths will degrade the speakers' performance.

Four M8 floor spikes and lock-nuts are supplied within the Linear Three packaging. The spikes and lock-nuts should be fitted to the underside of each Linear Three plinth once the speaker has been moved near its final location. Carefully lay the speaker on its back to gain access to the tapped holes in the plinth. Screw a spike and lock-nut into each hole leaving a length of spike extending beyond the lock-nut such that once the speaker is upright the lock-nuts will "float" just above the floor covering.

Tighten three of the lock-nuts on each speaker with a 13mm spanner leaving one lock-nut finger-tight to aid adjustment once the speaker is upright in its final position. Once the final position of each speaker has been established adjust the length of the loose spike such that the speaker is vertical and does not rock. If the floor is particularly uneven it may be necessary to loosen one of the tightened spikes to ensure that the speaker can be levelled.

Finally, tighten all loose lock-nuts. It may be necessary to re-adjust to minimise rock once the speaker has settled on the floor. Take care when installing floor spikes. They are sharp and can cause injury or pierce electrical cables.

The Linear Three can be "mass-loaded" in a compartment at the bottom of the cabinet. Mass loading can significantly improve the performance of the speaker. The compartment can be filled with washed, fully dried and non salt contaminated sand, or suitable metal chips, via the access hole in the the back panel. A plastic bung is provided to seal the cabinet. If you decide not to mass-load the speakers, we still recommend fitting the plastic bung to avoid unwanted resonance. Be aware that the plastic bung has not been designed to be removable after insertion. You may wish to use a temporary removable plug until you have made a decision whether to mass-load.

Linear 3 Rev E 1 16/8/05, 11:16 am

4. Positioning

The position of speakers within the listening room is likely to have more influence over their performance than any other aspect of their installation. It is worth spending some time experimenting both with the finer points of speaker positioning, as well as the larger scale issues of room layout.

If you are already familiar with the acoustic characteristics of your listening room, and the way speakers perform in it, you may already have a good feel for where to position your Linear Threes. However, installing any new hi-fi component provides a good opportunity to review an existing set-up and perhaps make improvements.

The position requirements for a pair of Linear Threes installed in an average sized and furnished listening room (say 4m x 5m) are as follows:

- Between 0.5 and 1.5 metres from the rear wall.
- 1.0 metres from side walls.
- Between 2.5 and 3.5 metres apart.
- Clear of corners.
- Angled inward towards the listening position.

Don't worry if, thanks to the architecture or layout of your room, it is not practical to follow each requirement. The most important thing is to experiment with the different options that are practical and find the one that works best.

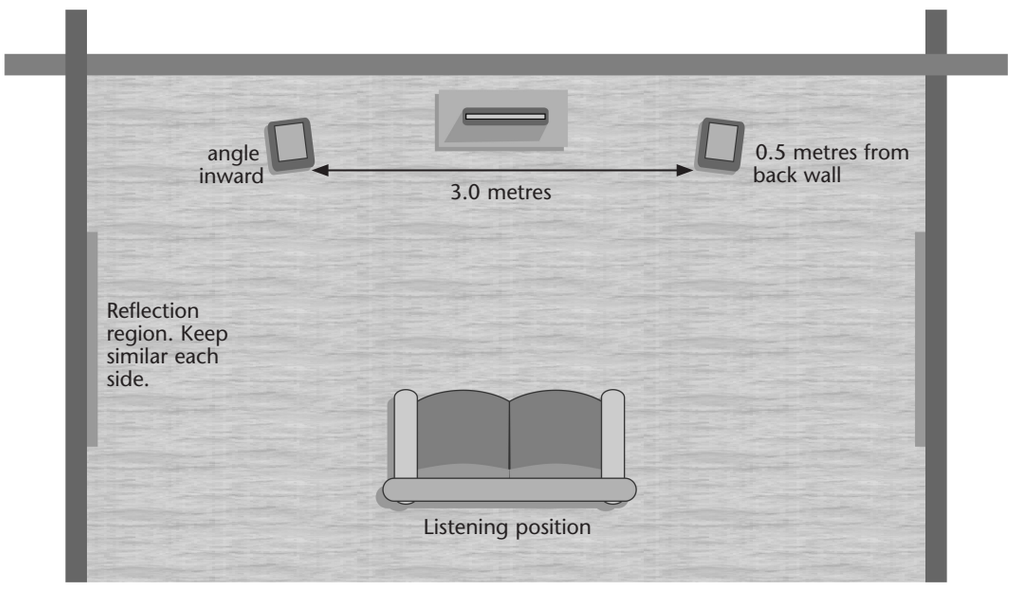
While it is often the first instinct to position a pair of speakers against the shorter wall of a rectangular room, it is often the case that a position against the longer wall will produce better results. This is because the long wall position tends to result in less prominent reflections from the side walls of the room. However, whether used against the long or short wall, it is important that each speaker of the pair is located in a similar acoustic environment (different environments would be, say, a curtained area and a solid wall). The acoustic character of the side walls of the room in the area where the main reflection between speakers and listening position will occur should also be similar. **Diagram One** illustrates a typical layout.

Once your Linear Threes are connected (see Section 5) and working, and you begin to become familiar with their performance, it is likely to be worthwhile experimenting a little more with their positioning.

Reducing the distance between the speakers and the rear wall will increase the level of bass and low midrange making the speakers sound warmer. The warmth however is likely to be gained at the expense of some mid-range clarity and stereo image focus and depth. Increasing the toe-in angle of the speakers may regain some image focus but again this is likely to be at a cost of image width and openness. Learning through experimentation how Linear Threes behave in your room will help you find the optimum solution.

The Linear Three is magnetically shielded and can be used in relatively close proximity to CRT screens.

Diagram One



5. Connecting

Connecting your Linear Threes is fundamentally a simple process, however, there are some choices to be made and issues to consider concerning connection mode, connectors and cable type.

Each Linear Three is fitted with two pairs of binding-post terminals - one pair each for the low frequency and high frequency drivers. Two pairs of terminals enables Linear Threes to be connected **conventionally** (single wire), **bi-wired** or **bi-amplified**. As supplied, the high and low frequency terminals are connected together by metal links ready for conventional connection.

The terminals can accept either stripped wires, spade connectors, or 4mm plugs. Each of these termination methods is potentially equally effective and the choice is likely to be influenced by type of speaker cable used. Your dealer, distributor or cable manufacturer will be able to offer advice.

Conventional [single wire] connection

Conventional connection requires that the shorting links remain in place between the high and low frequency terminals. Simply connect the speaker cable to either pair of terminals ensuring correct **connection polarity** as described below.

Bi-Wire Connection

Bi-wiring separates the low and high frequency connections and can provide enhanced sound quality. A second set of cables (or alternatively, a multi-way bi-wire cable) is required. The shorting links should be removed and stored for any subsequent single wire use.

The two cables for each speaker should be connected in parallel to the amplifier terminals. At the speaker, one cable should connect to the high frequency terminals and one to the low frequency terminals. Ensure correct **connection polarity** as described below.

Bi-Amplifier Connection

Bi-amplifier connection adds a second power amplifier to the system so that high and low frequency sections have dedicated amplifiers. Significantly enhanced sound quality is possible. One stereo amplifier should be connected to the high frequency terminals of each speaker and a second stereo amplifier connected to the low frequency terminals. The shorting links should be removed and stored for any subsequent single wire use. Ensure correct **connection polarity** as described below. Follow the amplifier manufacturer's guidence on connecting the amplifier input signals.

The shorting links must be removed for bi-amplifier connection. Failure to do so will likely result in damage to the amplifiers.

Connection Polarity

It is important when connecting speakers to ensure that each terminal is connected with the correct polarity. Positive speaker terminals should always be connected back to amplifier positive terminals, and negative speaker terminals connected back to amplifier negative terminals. Performance will be seriously degraded if connections are made with incorrect polarity.

Take care when connecting cables not to touch the negative and positive terminals together and "short-circuit" the amplifier. Make connections with the amplifier switched off.

Choice of cable type will be influenced by the characteristics of other components in your hi-fi system and your dealer or distributor will be able to advise. Even so, there are some simple guidelines to consider:

- Cable runs to each speaker should be kept as short as possible consistent with each being of equal length.
- Short cable runs are especially important if the cable is of relatively small cross-sectional-area.
- If the cable is advertised as "directional" care should be taken to ensure that its orientation is as recommended.

6. Amplifiers

The Linear Three is a relatively high sensitivity speaker that does not require a generously rated power amplifier for adequate volume levels to be achieved in an average listening room. A minimum of 25 and maximum of 150 Watts into 8 Ohms per channel is recommended. Linear Threes offer a relatively easy load to the amplifier and do not make unusually heavy demands on its power delivery.

No overload protection systems are fitted to the Linear Three so it is possible to cause damage through over-driving. Such damage can occur whatever the power rating of the amplifier and is not covered by any warranty. If ever the sound at high volumes becomes distorted your Linear Threes are at risk of damage. In such circumstances the volume must be reduced.

7. Listening

It is wise before listening to your Linear Threes to make one final check of the cables and connections. If all appears well begin listening at a relatively low level to confirm that the system is operating as expected. Only increase the volume if you are happy that the sound at low levels is fundamentally as expected. If you are unhappy, turn the system off and re-check all the cables and connections.

Linear Threes may take a little time to "run-in", and similarly the system will also perhaps take some time to reach normal operating temperatures. It is unwise therefore to make rapid judgements about the performance of the speakers. Your ears too will take some time to adjust to the new sound, so revisiting the system set-up, speaker positioning especially, is best left for a few days.

8. Specification

Type: Three-way, reflex loaded, time aligned speaker.

Bass Driver: 160mm pressed alloy cone with 25mm thermally bonded voice coil. Shielded high-power long-throw magnet system. Die-cast chassis.

Mid/Bass Driver: 130mm pressed alloy cone with 32mm thermally bonded voice coil. Shielded high-power long-throw magnet system. Die-cast chassis.

HF Driver: Pre-coated textile dome with ferro-fluid cooled neodymium magnet system and rear heat sink.

Filter Network: 2nd order at 300Hz, 3rd order at 3.5kHz.

Cabinet: 15mm MDF carcass with composite layer front panel and driver de-coupling.

Frequency Response: 40Hz to 28kHz ±3dB

Frequency Range: 30Hz to 30kHz @ -6dB

Power Handling: 150W peak programme

Amplifier Compatibility: 25 - 150 Watts into 8 Ohms

Nominal Impedance: 8 Ohms

Sensitivity: 90.5dB for 1 Watt at 1 metre

Terminals: Gold plated, bi-wire binding posts.

Dimensions (H x W x D): 905 x 242 x 270mm

Weight: 16kg (single, unpacked)

Acoustic Energy reserves the right to modify product specifications.

9. The Linear Range

The **Linear Three** is part of a range that includes the **Linear One** stand-mount speaker, the **Linear Centre** centre channel speaker and the **Linear Sub** active sub-woofer. **Linear One**, **Linear Three** and **Linear Centre** incorporate time-aligned drivers to improve image quality, depth and focus.

Linear One

Linear One is a compact two-way stand-mount speaker that adds high resolution accuracy to the imaging benefits of time alignment.

Linear Centre

Linear Centre is a centre channel speaker designed to combine with the Linear One or Three for perfectly matched audio-visual systems.

Linear Sub

Linear Sub is an active sub-woofer perfect for enhancing Linear Three bass performance or handling the low frequency effects channel in Linear audio-visual systems.

10. Warranty

Your Acoustic Energy speakers are guaranteed against original defects in materials, manufacture and workmanship for 3 years from the date of purchase.

Under this warranty Acoustic Energy agrees to repair any defect or, at the company's discretion, replace the faulty component(s) without charge for parts or labour. This warranty does not imply any acceptance by Acoustic Energy or its agents for consequential loss or damage and specifically excludes fair wear and tear, accident, misuse or unauthorised modification.

This warranty is applicable in the United Kingdom only and does not in any way limit the customer's legal rights. Claims and enquiries under the warranty for Acoustic Energy products purchased outside the UK should be addressed to the local importers or distributors. If you have reason to claim under the warranty please contact your dealer in the first instance.

Please retain all original packaging materials for possible future use. We suggest that you complete details of purchase now and keep this information in a safe place for future reference.

Name: _____

Address: _____

_____

Dealer: _____

Purchase Date: _____

Serial Numbers: _____

11. Contact

Acoustic Energy Limited
16 Bridge Road
Cirencester
Gloucestershire GL7 1NJ
UK

Tel: +44 (0)1285 654432 (Sales)
+44 (0)1285 656890 (Technical)
Fax: +44 (0)1285 654430
Email: info@acoustic-energy.co.uk
Web: www.acoustic-energy.co.uk

LINEAR three

Acoustic Energy Limited, 16 Bridge Road, Cirencester, Gloucestershire GL7 1NJ.
Tel: +44 (0)1285 654432 (Sales), +44 (0)1285 656890 (Technical). Fax: +44 (0)1285 654430
Email: info@acoustic-energy.co.uk
Web: www.acoustic-energy.co.uk

Manual Part No. MA1103